

NAME: _____

DATE: _____

Unit-2 Mastery Assessment (version 613)

Question 1 (10 points)

Let f represent a function. If $f[5] = 3$, then there exists a knowable solution to the equation below.

$$y = 7 \cdot f\left[\frac{x}{4} - 6\right] + 8$$

Find the solution.

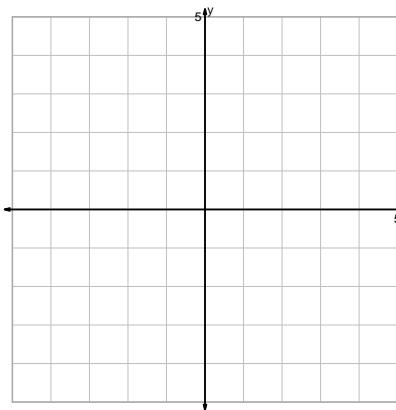
$x =$

$y =$

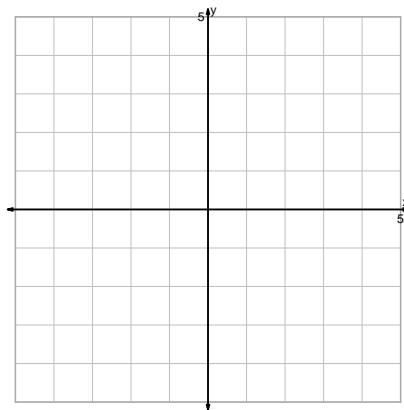
Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

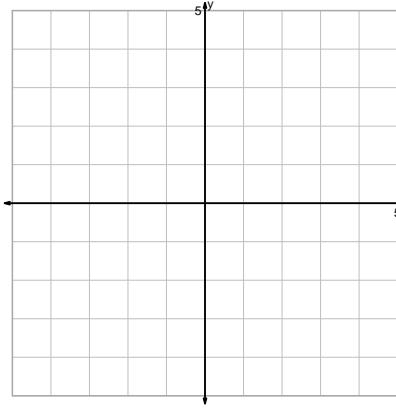
$$y = 2^x - 2$$



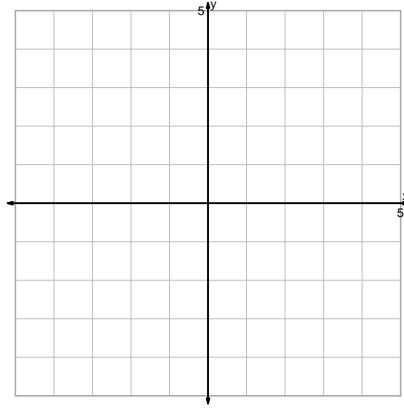
$$y = 2 \cdot \log_2(x)$$



$$y = x^2 + 2$$

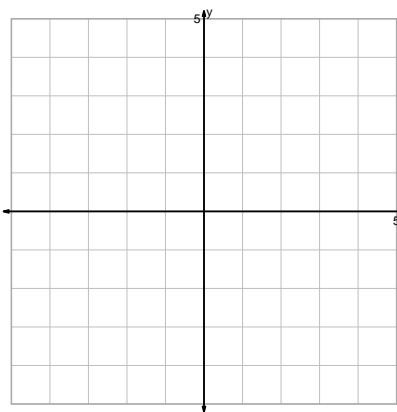


$$y = \sqrt{-x}$$

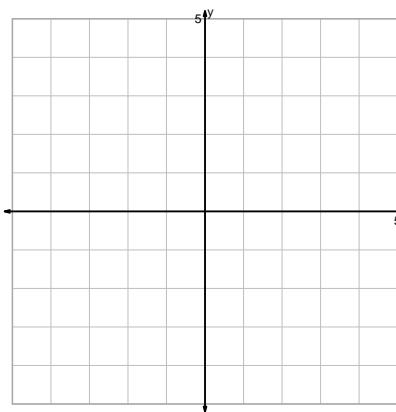


Question 2 continued...

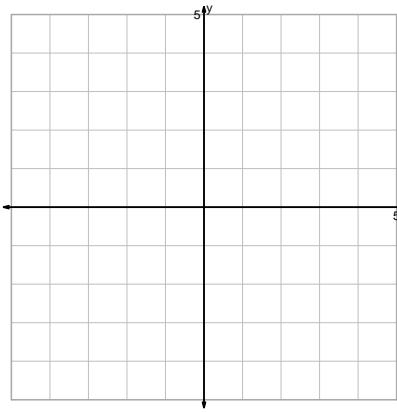
$$y = (x - 2)^3$$



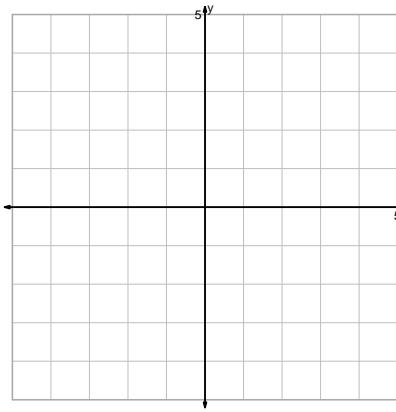
$$y = \sqrt{2}x$$



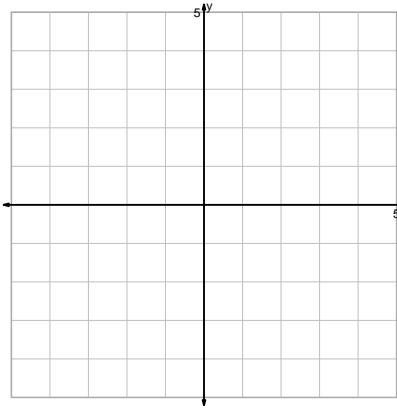
$$y = \left(\frac{x}{2}\right)^2$$



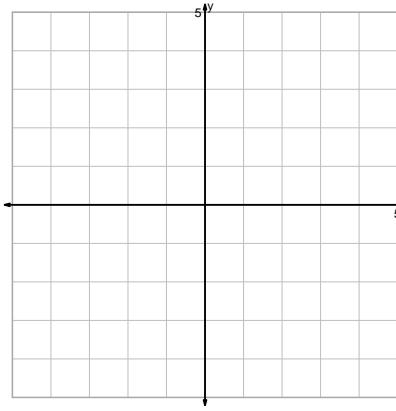
$$y = \sqrt[3]{x + 2}$$



$$y = -\log_2(x)$$

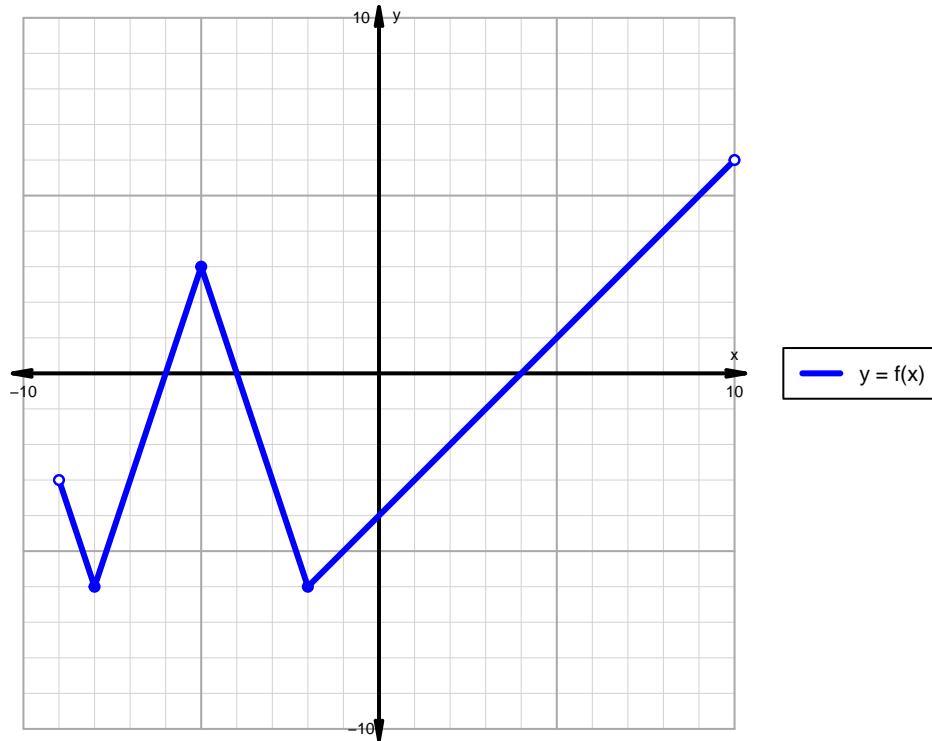


$$y = \frac{x^3}{2}$$



Question 3 (20 points)

A function is graphed below.



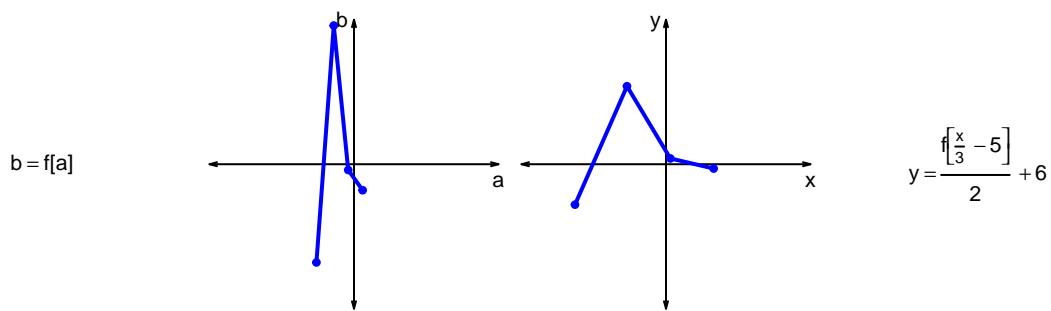
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = \frac{f[\frac{x}{3} - 5]}{2} + 6$ are represented below in a table and on graphs.

a	b	x	y
-26	-68	-63	-28
-14	96	-27	54
-4	-4	3	4
6	-18	33	-3



- a. Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f[\frac{x}{3}-5]}{2} + 6$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

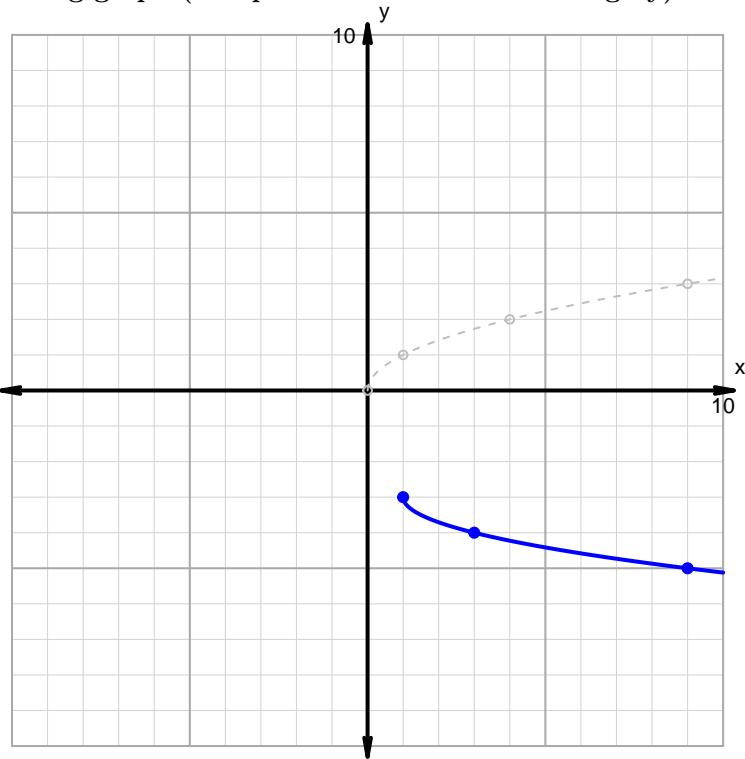
Horizontal transformations

1. Horizontal stretch by factor 2.
2. Translate right by distance 1.

Vertical transformations

1. Vertical reflection over x axis.
2. Translate down by distance 3.

Resulting graph (and parent function in dashed grey):

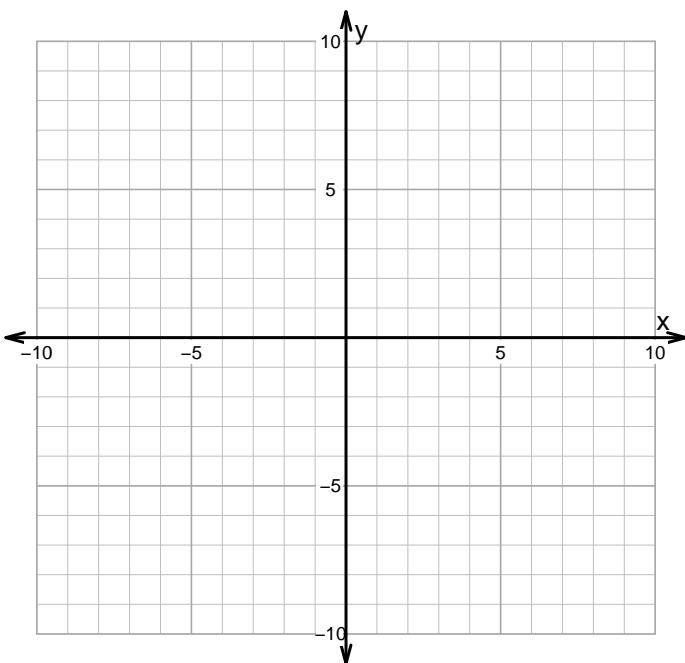


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{-1}{2} \cdot |x + 3| + 1$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	